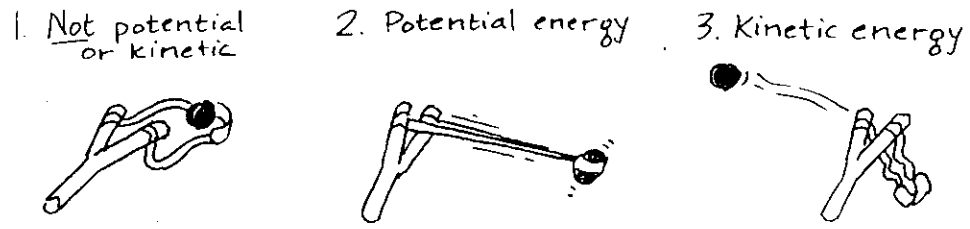
ENERGY IS

Grades 4-6



Overview

The teacher demonstrates potential and kinetic energy using a sling shot and ping pong ball. The students and teacher look at and discuss different types and sources of energy (see materials). Using 4 by 6 note cards and rubber bands, students demonstrate kinetic and potential energy. *Optional activity: the presenter hooks up a battery to a light bulb.*

Objectives

- Students will demonstrate an ability to recognize potential and kinetic energy.
- Students will develop an understanding that energy occurs in different forms.
- Students will be able to name four different types of energy.
- Students will develop an understanding that energy is the capacity to do work (move objects) or produce change.

Vocabulary

Energy: the ability to work or produce change
Kinetic energy: Energy of motion
Potential energy: An object that is not in motion, but could be due to its position is known as having potential energy

Materials

For the presenter:

- sling shot and ping pong ball or rubber band and folded paper wad
- samples of the following energy sources on a tray:
  - Light (flashlight and sunlight)
  - Oil (e.g., a can of it)
  - Wood (a piece of wood)
  - Plant or (a picture of a cherry or apple tree)
- Wind (e.g., a fan or outdoor wind)
- Falling water (faucet or pour water from a pitcher into a glass)
- overhead transparencies of Energy Evaluation worksheet and Index Cards

Optional Activity

- a battery-operated toy
- the necessary batteries to operate it.
- a battery (dry cell)
- 1.2 volt bulb
- a short 6 inch solid bare copper wire

For each student

- 1 - 2 puff balls also called pom poms (buy a package at a craft's store)
- 1 - 2 rubber bands
- One 4 x 6 lined index card
- scissors and a ruler
- energy evaluation worksheet

Getting Ready

Make index card (see next page) and energy evaluation transparencies(attached) for the overhead. Make copies of the evaluation worksheet. Have all materials arranged on a table for easy access.

Procedures

1. Share the objectives with the students.

2. The teacher places a ping pong ball in a sling shot. First, pull the ball back only about one to two inches so there is slack in the sling. Ask the students what will happen when you let go. ***(Anticipated answer: The students will tell you that the ball will not travel through the air, but will drop to the floor.)*** They will most likely encourage you to pull the sling shot all the way back.

3. Explain to the students that there are two types of energy: ***kinetic*** and ***potential***. Have a student read these vocabulary words and their definitions from the blackboard / overhead.

4. Now pull the sling shot with the ping pong ball as far back as possible, but don't aim it at any students rather aim it at a corner or other safe place. Ask the students what type of energy you are demonstrating. ***(Anticipated answer: "potential)***

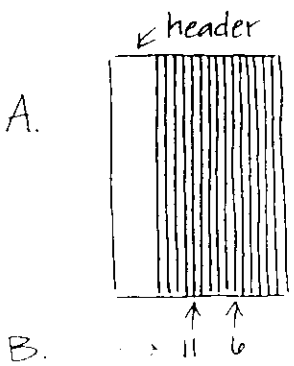
5. Tell the students that when you release the sling shot, they are to call out the name of the type of energy that they see. Release it and let the ping pong ball fly through the air in a safe direction. ***(Anticipated Response: kinetic)***

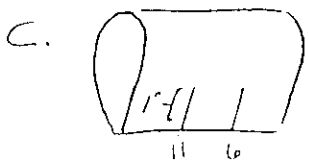
6. Ask the students to look at the samples of energy that you have and to explain which ones are energy sources used by people to provide body energy, to grow food, to run machines, and to heat buildings. Have them explain how each sample is a source of energy.

7. Explain that energy is all around us in different forms, and read them the definition from the overhead/blackboard: ***Energy is often defined as the ability to work or produce change.*** Give a few examples of energy or energy products in the classroom such as: the light from a light bulb or the sun ***(radiant energy),*** something dropped onto a desk ***(gravitational energy),*** food ***(potential chemical energy)***, a machine with moveable parts ***(mechanical energy).***

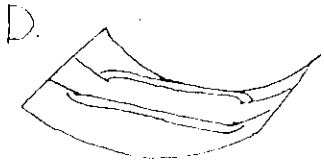
8. Pass out index cards. **(See the drawings below and directions on next page)**

Index Card Drawings





Cut up one inch on 6th and 11th line.



9. *Steps for project:*
   a. Have the students place their index cards with the line side up and the header on the left side. (Demonstrate.) Have the students start counting from the line on the right side to the left side, marking the 6th line and 11th line with a pen or pencil. With a pencil, they are to draw in one inch on the 6th & 11th line. (It is a good idea to have a note card transparency to demonstrate on the overhead.

   b. Have each student hold their card top edge to the bottom edge without creasing or folding the card completely in half. The lines are to be on the outside and the blank side is on the inside.

   c. Holding their cards in this position, the students are to cut up one inch on each pencil line.

   d. They are to open up their cards, and with the "lines side" facing up, they are to fasten a rubber band around each center cut tab.

   e. Only when every student has his or her card set up with the rubber bands fastened to it, you ask if kinetic or potential, is represented as you hold the corners down? ***(Anticipated answer: "potential")***

   f. ***"On the count of three, let your cards go and call out the type of energy. 1, 2, and 3."*** **(Anticipated answer: "kinetic!"** as their cards flap into the air.)

Closure

Have the students pair up. While explaining potential and kinetic energy to each other they are to use their rubber bands and cards to demonstrate these terms.

Optional Activity 1

(Some teachers might choose not to do this fun activity with their students because it may be difficult to get them to settle back down.)

Explain to the students that they can now demonstrate potential and kinetic energy by using a rubber band to shoot the puff balls at each other. Establish the rules by telling the students that anyone shooting into someone's face or in any way not using the rubber bands and puff balls appropriately will lose their puff ball and rubber band. Pass out the puff balls and allow the students to demonstrate potential and kinetic energy.

Optional Activity 2

Materials

- a battery-operated toy
- the necessary batteries to operate it.
- a battery (dry cell)
- 1.2 volt bulb
- a short 6 inch solid bare copper wire.

Objective

- The students will develop an understanding of how energy occurs in different forms by observing an example of chemical energy which is converted to mechanical energy.

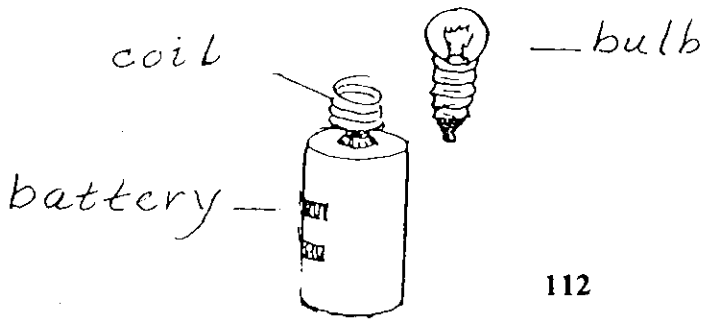
Procedures

1. Show the students a battery-operated toy without a battery. Ask them what is needed for it to operate ***(to move).*** They will most likely tell you that it needs a battery. Next explain that it is energy that has the ability to move an object or to produce change. Remind them that energy is what lights a light bulb, and the chemical energy from the battery enables the toy to move ***(electrical energy).*** A light bulb giving off light is an example of energy producing a change. The moving toy is an example of energy working by moving an object.

2. Ask the students if a battery is an example of ***potential*** or ***kinetic*** energy. Help them understand that because a battery contains stored energy that has not been used, it is an example of potential energy.

3. Put the battery into the toy and operate the toy. Ask the students what types of energy are occurring as they observe the toy. Explain that chemical energy is traveling from the battery to the toy, and both mechanical and kinetic energy are occurring as the toy moves.

4. Take the copper wire and wind it along the groove of the bulb and bend the wire around the battery. Tape the end of the wire against the negative pole of the battery. (See sketch)



5. Turn the bulb to the right until the bulb lights.

6. Tell the students that the class is going to discuss the different types of energy involved in lighting the light bulb.

7. Again, ask the what type of energy is stored in the battery. ***(Potential)***. Ask them if they know what type of energy the battery converts the chemical energy into. ***(Electrical)***

8. Electricity is a form of what type of energy? ***(Kinetic)*** Now to review the types of energy, tell them you are going to twice make some statements with blanks in them, and the second time you make the statement you will point to them to call out loud the word that goes into the blank.)

Statements: A battery contains ___(blank)___ energy. ***(Potential)***
A battery converts chemical energy into ___(blank)__energy. ***(Electrical)***
Electricity is a form of ___(blank)___ energy. ***(Kinetic)***
The light bulb converts electrical energy into ___(blank)___ and ___(blank)___ energy. ***(Light, Heat)***

Closure

Pass out an evaluation to each group of four students. Show the students the overhead with the examples of energy and have the students decide if each example is ***(P)*** potential or ***(K)*** kinetic and complete the Word Choice.

Answers

1.K, 2.K, 3.P, 4.K, 5.K, 6.P, 7.K, 8.P
1. Potential, 2. Electrical, 3. Kinetic, 4. Light, Heat

Clean Up

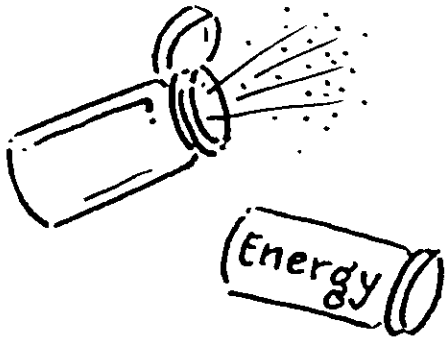
The classroom needs to be left just as it was. Give each group specific clean up tasks, and compliment the groups/students.

Supplementary Activities

For a future art lesson, the students can create mobiles that display several different sources of energy.

Can It!

Grades 4-5



Overview

The students will explore different examples of potential energy. They will build a rolling can. The roller works by storing and then releasing energy.

Objectives

- To help students understand the way things store energy.
- To help students understand the meaning of potential energy.

Materials

For presenter:

- some examples of potential energy
- a couple of different kinds of food
- a battery
- a piece of coal
- wood
- water
- a plant
- a wind-up toy
- shoe box
- ***Potential Energy*** written on a large strip of paper
- a sample **Rolling Can** to use for a demonstration

For each group of 4 students:

- 1 wide mouth plastic jar with lid or tin can with lid
- 1 long heavy duty rubber band
- 2 large metal nuts
- scissors or a can "punch" opener
- short pieces of string
- 2 used match sticks or other small wooden sticks

Getting Ready

Put the strip with the words, ***Potential Energy***, in the shoebox. Put it, along with the examples of potential energy, on a table in an area where all the student will be able to see. Put together an example of a Rolling Can. It will be used to demonstrate how the Rolling Can looks and works. Put the materials that the students will need for their project on a table that has easy access by the students.

Procedures

Activity 1: Boxed Up

Review with the students what they know about energy. They should be familiar with sources of energy and how things use energy. Hold up the shoebox. Tell the students that when you are not using you favorite basketball shoes, you store them in a box so they will be in good shape when you need them.

Questions

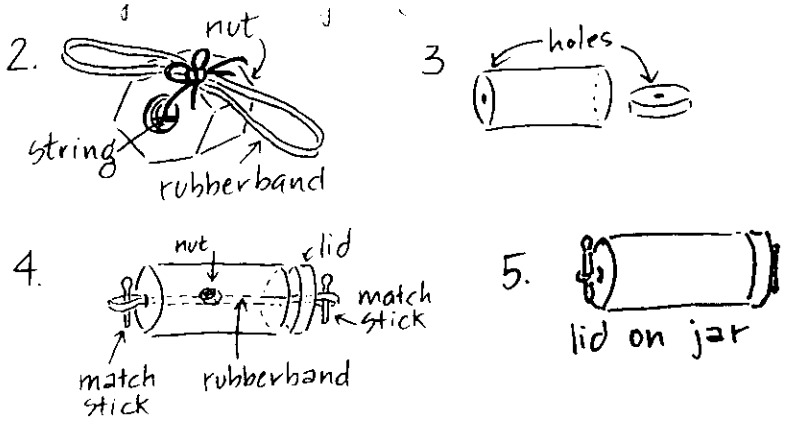
"What other things are stored until you are ready to use them?" Tell the students that energy is just like your shoes. It also is stored until someone or something is ready to use it. Lift up the lid of the box and take out the words ***Potential Energy.*** Hold it up and have someone read it for you. Tape it on the chalkboard for future reference. Ask the students if anyone knows what it means. If not, tell them that it is a word for stored energy. Ask the students: "Do you know any examples of stored energy?" Wait for responses and then share with the students the examples of potential energy you brought. Ask questions that will invite thinking: "What is stored energy? How is it used? When is it no longer potential energy? Can you think of any other examples of potential energy?"

Activity 2: Let It Roll

Tell the students that they will be building a toy today that stores its own energy. They will work in partners. Before handing out any materials, show the student the model that you made. As they watch you demonstrate the rolling can, tell them to try to figure out where it gets its energy. Where does the toy stores its energy? After a short discussion, tell the students that you will hand out the materials and build the rolling can together. Remind each group that they will need to take turns during building.

Hand out materials to each pair of students and then give the following instructions:

1. "Tie the nuts to the middle rubber band with string. Thread the string through the center of the nuts and tie the rubber band on top."
2. "Carefully, with the point of your scissors make a small hole in the lid and the bottom of your jar." (You may need to help with this depending upon the types of plastic jars the students are using.)
3. "Thread the rubber band through the hole in the bottom of the jar. Stick a matchstick through the rubber band on the outside of the jar, to keep the rubber band from pulling back through the hole. Push the other end of the rubber band through the hole in the lid. Stick another matchstick through the rubber band to prevent it from pulling back through the hole. Now your can is ready to perform." Have each group find a place on the floor or table where they will be able to experiment with their can.
4. Roll the jar across the floor. (As it rolls forward the rubber band is winding up.)
5. As the can becomes harder to push (because the rubber band is tight), let go and the can will roll the opposite direction.



Discussion

Rubber bands can store and release energy. When you stretch or twist a rubber band, the band stores up energy. When you let go of the jar, the energy in the rubber band is released and the jar rolls back.

As you move around the classroom, ask the students to show you where the potential energy is stored ***(rubber band).*** Ask the students: "What happens when the potential energy is released? Try rolling it down hill and see if it will roll back up hill by itself."

Closure

Point to the strip with the words ***Potential Energy,*** and have each student tell their group what potential energy is. Ask one student to tell the class.

Clean Up

Each team is responsible for picking up the things they were using to build the rolling cans.

ELECTRICITY

Grades 4-5

Overview

The students will be involved with three experiments that will help them understand that rubbing certain objects results in the removal of electrons and a build up of positive or negative charges.

1. The students will have to figure out how the teacher got balloons to stick to the blackboard. Once they figure this out, the students attempt to stick balloons onto the blackboard.
2. The students use a "magic comb" to make a thread stand upright.
3. the students will use a comb to separate salt from pepper.

Objectives

- The students will demonstrate an understanding that rubbing certain objects will result in the removal of electrons and a build up of positive or negative charges.
- The students will demonstrate an understanding that certain uncharged objects are attracted by charged objects.
- The students will demonstrate an understanding that there are two kinds of static charges: negative and positive.

Vocabulary

Static: stationary or not moving
Positive: a positive electrical charge that is designated by the symbol "+"
Negative: a negative electrical charge designated by the symbol "-"

Materials

Activity 1: Balloon Garden

For the presenter:

- wear a **wool** shirt or blouse.
- three or four balloons
- a clean blackboard
- silk material
- wool material
- cotton material
- an overhead projector

For each student:

- 1 balloon (have a few extras)

Activity 2: The Magic Comb

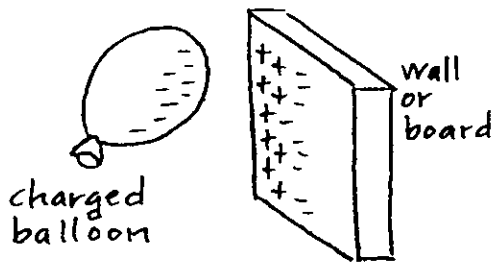
For each group of students:

- 1 comb
- a piece of thread
- Optional, but super - 1 comb & thread for each student

Activity 3: Please Pass the Pepper

For each group of students:

- a mixture of table salt and pepper
- a comb (same one used for activity 2)
- a sheet of wax paper



Getting Ready

1. Blow up four balloons.
2. Draw a picture of the - negative charged balloon and the + positive charged wall on the overhead or blackboard. (See picture below.)
3. Have all the materials set up by activity on a table.

Procedures

1. Tell the students that you are planting balloons in a row on the blackboard.
2. As if cleaning the dust off the balloon, rub your **wool** sleeve carefully against the balloons, then stick them to the blackboard in a horizontal row.

3. Hand out a balloon to each student.

4. Have the students blow their balloons up and ask them if they can start another row of balloons in your "balloon garden."

5. Ask volunteers to come up and start another row in your balloon garden.

6. When they figure out that you are rubbing the balloons to get them to stick, have them rub their balloons against their hair or shirt and then try to make another balloon row.

Questions

"How did the balloons stick to the blackboard?"

"What did the rubbing do to the balloon?"

"Try rubbing the balloon against cotton, silk, wool, and hair. Did you find any difference in the static charge built up?"

"Do you think the balloons will stick better to the blackboard on a very cold winter day or on a rainy day? Please give reasons for your answer."

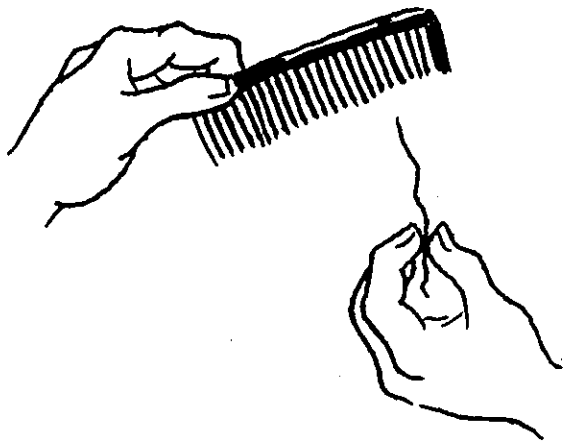
"Will the balloons stick to the walls indefinitely?"

Explanation

When rubbing the balloons, the material that is being rubbed against it loses some electrons; consequently, the balloon obtains an excess of electrons, which gives it a ***negative charge***. Initially, the wall in the balloon had the same type of charge but when the material was rubbed against the balloon, making it negative, the wall has a positive charge in comparison to the negative charge of the balloons. Since opposite charges attract, the negative balloon is attracted to the positive wall. **(See drawing above and show this drawing on the overhead to the students as you explain.)** The easier a material loses its electrons while rubbing against the balloon, the easier the balloon gets charged. The most common materials to charge the balloons are wool, cotton and hair. When the negatively charged balloon approaches the board, the negative charges are repelled and then a positive charge is induced at the spot where the balloon touches the blackboard. This is why the balloon initially sticks to the surface of the board, but eventually with time, the electrons will transfer from the balloon to the board, and the balloon gets neutralized and drops to the floor. Water is an excellent conductor of electricity, so on a humid or rainy day, the loss of an excess charge occurs easier and the balloons may not stick to the blackboard or will stick for a very short period of time.

Closure

Ask students to draw the "balloon garden" showing the electrons on the balloon and the electrons on the wall. An indication that they have understood the concepts would be their showing negative electrons on the balloons and both positive and negative electrons on the wall.



Activity 2: The Magic Comb

Procedures

1. Hand out the materials for Activity 2.
2. The students are to follow each step with you.
3. Holding a piece of thread in one hand ask the students to observe the thread's position in relation to your hand. ***(It will hang down.)***
4. Run a comb briskly on your clothing. (Have the students do the same.)
5. Bring the comb near the free end of the thread. As you do this, you'll make the thread stand straight up
6. Move the comb in small circles above the thread; the thread will also move in small circles.

Questions

"How was the thread different after you placed the comb above it compared to before you placed the comb over it?"

"Why does the thread move in circles when you move the comb in circles?"

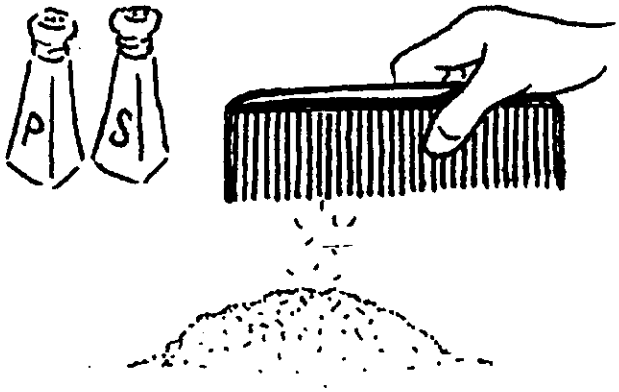
Explanation

Call upon the students to explain this in their groups if they are in groups. After the first activity, they should now understand the main concepts. Walk around listening to them. Choose one student to explain it to the class.

Static electricity makes the trick possible. When you rubbed the comb on your clothing, friction caused the free electrons to leave the clothing and attach themselves to the comb, giving it a negative electric charge. Free electrons are repelled from the thread, leaving it positively charged. Because opposite charges attract, the thread is drawn towards the negatively charged comb.

Closure

Using the terms negative and positive charges, have the students turn to someone near them and explain to each other why the thread stood upright and moved in small circles.



Activity 3: Please Pass the Pepper

Materials

For each student or group of students:

a mixture of table salt and ground pepper on a sheet of wax paper
a comb (same comb used in activity 2)

Procedures

1. Pass out the mixture of salt and pepper on the wax paper and combs to each student or each group of students.
2. Ask the students how can the pepper can be separated from the salt; in other words "please pass only the pepper."
3. If they don't come up with the answer, run your comb through your hair and hold it over the salt and pepper mixture. The pepper will jump to the comb because it is lighter than the salt.

Questions

"What did running the comb through your hair accomplish?"
"Why did only the pepper stick to the comb?"
"What is another way to separate the pepper from the salt?"

Explanation

Initially, the salt and pepper and the comb all had identical electrical charges. By rubbing the plastic comb through one's hair, the comb is charged with static electricity from the excess electrons left on the plastic by one's hair, making it negative. The salt and pepper have identical charges but one grain of salt is about 100 times heavier than one pepper flake. They both have positive charges compared to combs negative charges. The combs negative charge is strong enough to pick up the positive pepper flake but it is not strong enough to pick up the heavy positive grain of salt.

Closure

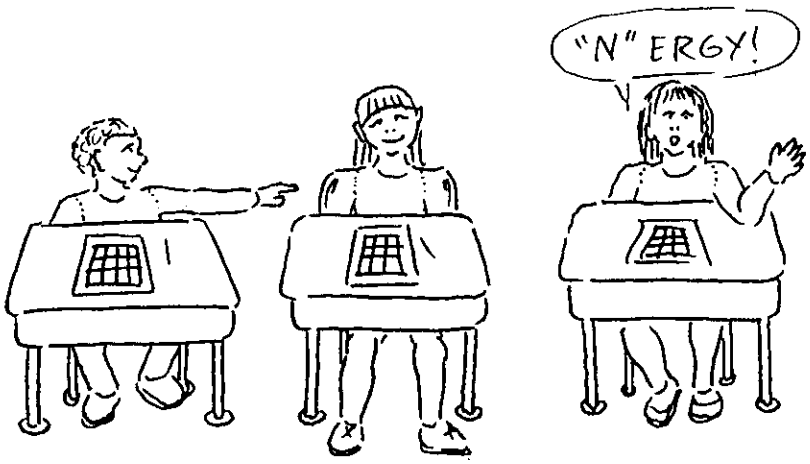
Have half the class stand and form themselves into the shape of a comb. Have the other half of the class count off by twos. The ones are salt and the twos are pepper. Tell the "comb students" that they were just rubbed through a giant's hair. Ask them what is the consequence of this? Then have the "pepper students" jump to the comb if they first can explain why they will do this. Ask the "salt students" to explain why they are not jumping to the comb.

Clean Up

The classroom needs to be left just as it was. Give each group specific clean up tasks, and compliment the groups/students.

"N"ERGY

Grades 4-6



Overview

By playing "**N"ERGY** the students will become familiar with energy's many different sources and forms. The students play a game similar to BINGO, but in this case the letters are "**N**"ERGY that stands for energy. The students have "**N**"ERGY cards in front of them with words in each square that stand for sources / types of energy. The first few times the students play the game they can use their " energy fact sheets" that have the terms and their definitions. Later, the teacher reads the definition and if a student knows the term and has the term on his or her sheet, he/she can place a marker on that space. The first student who has five markers straight in a row calls out, "**N**"ERGY! Then the child calls out the terms he/she covered and the teacher checks to see if these are correct.

Objectives

- The students will develop an understanding that energy is the capacity to do work, or produce change.
- The students will develop an understanding that energy can be classified in different way depending on its different sources.
- The students will develop an understanding that energy comes in many different forms.

Materials

For the presenter:

- flashlight
- the teacher's "N"ERGY sheet (a list of terms and their definitions)
- a box or some type of container to draw the definition strips out of and read tothe class.
- a teacher's **"term list"** with all the terms in alphabetical order. The teacher uses this to check off the correct term every time he/she reads a definition and then uses it to verify if a student does have the correct terms for "N"ERGY. Note: If the teacher laminates this list, he/she can check off the terms used and then wipe clean for the next game.

For the students:

- "N"ERGY sheet - use the same one for all students in the first few games
- space markers - to cover the terms on the "N"ERGY cards
- **"N"**ERGY cards - There are five different cards; look for the * by one of the letters in the word "N"ERGY at the top of the cards. Give the students different cards.
- dictionaries and encyclopedias

Getting Ready

Make sure you have the "N"ERGY definition sheets cut apart, term list, and cards ready to pass out to the students. There are five different students' cards to use. If the students are going to play the game in groups of four, make sure you have grouped the students so they are well balanced. If time allows laminate the term list before the lesson.

Procedures

1. ***Focus:*** Energy is the capacity to do work or produce change. Energy appears in many forms. It is all around us at all times, but we call it by different names depending on its source. Shine the flashlight into the students' faces and explain that ***light*** is a radiant energy. Ask them to name the light's energy source. ***(Anticipated Answer: a battery)*** Ask them if they can name another radiant energy whose source is not a battery. ***(Anticipated Answer: the sun.)*** Tell them that nearly all energy comes ultimately from the sun. Energy sources can be classified in many different ways, and today we are going to be learning about many of these ways by playing an energy word game.

2. Share the objectives.

3. Pass out the **"N"**ERGY sheets, cards, and space markers to the students, and explain that the game is played like Bingo, except this game is called **"N"**ERGY because their cards contain words naming different sources of energy.

4. Explain the following: Either the teacher or a student can be a "caller," The caller draws a definition strip from a container and reads. Each time the caller reads a definition, he/she checks off the term on the term sheet If students can match a term on their cards with the definition, then they place a space marker over that word. The first few games the students can use their **"N"**ERGY sheets, but another day they can play the game without the sheets. When a student has a complete line down, across, or diagonally, he/she calls out **"N"**ERGY! Then the student calls off the terms that were covered to make a straight line, and the caller looks at the term list to confirm if the student is correct.

5. With fifth or sixth graders, the game can be made more challenging if the student who calls out **"N"**ERGY is required to define each term in their own words.

Closure

Students choose one term from their card and define it for their group or the class. The students need to listen carefully to each other because the students can "beep" anyone who repeats a term already presented and defined. (A student beeps by calling out quietly *"beep"* if they hear someone repeat an answer that has already been given.)

Clean Up

The classroom needs to be left just as it was. Give each group specific clean up tasks, and compliment the groups/students.

Supplementary Activities

1. The students play the game without their **"N"**ERGY definition sheets.
2. The students look up the terms in dictionaries and encyclopedias to share with the class.
3. The students cut out pictures of different energy sources in magazines and glue them into a blank **"N"**ERGY card to make a picture game instead of a word game."

4. The students make an "energymobile."

N *	E	R	G	Y
battery	nuclear	primary	propane	renewable
chemical	fusion	uranium	gravity	wind
crude oil	oil shale	**FREE**	steam	radiant
gasoline	hydroelectric	tidal	wood	potential energy
coal	fission	oil	electricity	geothermal

N	E *	R	G	Y
coal	fission	geothermal	methane	oil shale
methane	gravity	renewable	radiant	nuclear
tidal	wood	**FREE**	electricity	gasoline
kinetic	food	fossil fuels	garbage	fuel
heat	solar	kinetic	primary	chemical

N	E	R *	G	Y
kinetic	solar	wood	coal	fission
fossil fuels	water	potential	charcoal	heat
steam	wind	**FREE**	food	uranium
geothermal	methane	gravity	renewable	tidal
propane	oil	hydroelectric	fusion	crude oil

N	E	R	G *	Y
fossil fuels	chemical	battery	fuel	gasoline
nuclear	wind	primary	crude oil	kinetic
steam	oil shale	**FREE**	uranium	fusion
heat	propane	charcoal	water	food
electricity	solar	oil	hydroelectric	radiant

N	E	R	G	Y *
battery	coal	food	gasoline	hydroelectric
nuclear	natural gas	oil	gravity	solar
steam	potential	**FREE**	kinetic	wind
water	garbage	wood	chemical	charcoal
electricity	tides	fuel	fossil fuels	energy

TERM LIST

battery ☐

chemical ☐

coal ☐

crude oil ☐

electrical ☐

electricity ☐

energy ☐

fission ☐

food ☐

fossil fuels ☐

fuel ☐

fusion ☐

garbage ☐

gasoline ☐

geothermal ☐

gravity ☐

heat energy ☐

hydroelectric ☐

kinetic ☐

methane ☐

natural gas ☐

nuclear ☐

oil ☐

oil shale ☐

potential ☐

primary ☐

propane ☐

radiant ☐

radiant ☐

renewable ☐

solar ☐

steam ☐

thermal ☐

tidal power ☐

uranium ☐

water ☐

wind ☐

wood ☐

N ✷	E	R	G	Y
battery	nuclear	primary	propane	renewable
chemical	fusion	uranium	gravity	wind
crude oil	oil shale	**FREE**	steam	radiant
gasoline	**hydroelectric**	tidal	wood	potential energy
coal	fission	oil	electricity	geothermal

N	E ✷	R	G	Y
coal	fission	geothermal	methane	oil shale
charcoal	gravity	renewable	radiant	nuclear
tidal	wood	**FREE**	electricity	gasoline
water	food	fossil fuels	garbarge	fuel
heat	solar	kinetic	primary	chemical

N	E	R ✷	G	Y
kinetic	solar	wood	coal	fission
fossil fuels	water	potential	charcoal	heat
steam	wind	**FREE**	food	uranium
geothermal	methane	gravity	renewable	tidal
propane	oil	**hydroelectric**	fusion	crude oil

N	E	R	G ✷	Y
fossil fuels	chemical	battery	fuel	gasoline
nuclear	wind	primary	crude oil	kinetic
steam	oil shale	**FREE**	uranium	fusion
heat	propane	charcoal	water	food
electricity	solar	oil	**hydroelectric**	radiant

N	E	R	G	Y ✷
battery	coal	food	gasoline	**hydroelectric**
nuclear	natural gas	oil	gravity	solar
steam	potential	**FREE**	kinetic	wind
water	garbage	wood	chemical	charcoal
electricity	tides	fuel	fossil fuels	energy

TERM & DEFINITIONS

Battery: A device for generating an electric current by chemical reaction.

Charcoal: A black, porous carbonaceous material produced by the heating of wood and used as a fuel.

Chemical energy: A form of energy existing in coal, natural gas, oil and all chemical compounds.

Coal: A hydrocarbon mineral formed from organic matter (plants) that is often used to generate electricity or heat.

Crude oil: Unrefined petroleum that is made up of thousands of different hydrocarbons.

Electric energy: The energy of electric charges that is measured in watts or kilowatt hours.

Electricity: A secondary energy source; an electric current used as a source of power.

Energy: The ability to do work or produce change.

Fission: The splitting of atoms to release energy.

Food: The stored chemical energy (photosynthesis) from plant and animal origin consisting of essential nutrients as a source of energy for people and animals.

Fossil fuels: Coal, oil, and natural gas that are formed from ancient plants and animals.

Fuel: Anything that burns to produce heat energy.

Fusion: The combining of atoms to release energy.

Gasoline: A mixture of flammable liquid hydrocarbons made from crude petroleum and used as a fuel for cars, etc.

Garbage: The useless or discarded materials (refuse) that can be used to produce natural gas or generate electricity.

Geothermal Energy: The heat energy from within the earth in the form of: 1) steam, 2) hot water, or 3) hot rocks or volcanic molten rock.

Gravity: The natural attraction between massive bodies; the force that pulls an object in midair to the earth.

Heat energy: The energy produced from the burning of a fuel like coal, oil, and natural gas, or the fusion of uranium.

Hydroelectric: Generating electricity by using the energy of falling water.

Kinetic: Energy of motion.

Methane: The simplest or basic hydrocarbon unit (molecule) that makes up 90% of natural gas.

Natural gas: A combustible gas found in the earth that is used to heat water, homes, and cook food.

Nuclear energy: The energy inside the nucleus of the atom which binds the nucleus together.

Oil: Any of many kinds of combustible liquids obtained from animals and plants that is used as a fuel.

Oil Shale: A sedimentary rock containing kerogen. The kerogen yields crude oil when heated.

Potential Energy: Energy stored in an object due to its position.

Primary Energy: Energy in its naturally occurring form: coal, oil, and natural gas.

Propane: A combustible gas found in natural gas that contain 3 carbon and 8 hydrogen atoms (C^3H^8)

Radiant Energy: Energy transmitted by waves such as light through space or other medium..

Renewable Energy: A nondepletable source of energy as the sun.

Solar energy: The primary source of all energy; this is radiation energy from the sun.

Steam: The vapor phase of water that can be used as a energy source.

Tidal Power: The power created by the falling and rising of the ocean tides.

Uranium: The fuel used in a nuclear reactor to generate electricity.

Water: The potential energy of this liquid when it is located at elevations above sea level can be used to produce electricity.

Wind: A form of moving (kinetic) energy produced in part by the sun's heating of the earth's atmosphere.

Wood: The fibrous xylem of trees and shrubs often burned for fuel.

DEFINITION STRIPS

Battery: A device for generating an electric current by chemical reaction.	**Energy:** The ability to do work or produce change.
Charcoal: A black, porous carbonaceous material produced by the heating of wood and used as a fuel.	**Fission:** The splitting of atoms to release energy.
Chemical: Mineral Energy: A form of energy existing in coal, natural gas, and oil.	**Fossil Fuels**: Coal, oil, and natural gas that are formed from ancient plants and animals.
Coal: A hydrocarbon mineral formed from organic matter (plants) that is often used to generate electricity or heat.	**Fuel:** Anything that burns to produce heat energy.
Crude oil: Unrefined petroleum that is made up of thousands of different hydrocarbons.	**Fusion:** The combining of atoms to release energy.
Electric Energy: The energy of electric charges that is measured in watts or kilowatt hours.	**Gasoline:** A mixture of flammable liquid hydrocarbons made from crude petroleum and used as a fuel for cars.
Electricity: A secondary energy source; an electric current used as a source of power.	**Garbage:** The useless or discarded materials (refuse) that can be used to produce natural gas or generate electricity.
Geothermal Energy: The heat energy from within the earth in the form of: 1) steam, 2) hot water, or 3) hot rocks or volcanic molten rock.	**Gravity:** The natural attraction between massive bodies; the force that pulls an object in midair to the earth.
Heat energy: The energy produced from the burning of a fuel like coal, oil, and natural gas, or the fusion of uranium.	**Potential Energy:** Energy due to its position.
Hydroelectric: Generating electricity by using the energy of falling water.	**Primary Energy:** Energy in its naturally occurring form: coal, oil, and natural gas.
Kinetic: Energy of motion.	**Propane:** A combustible gas found in natural gas that contain 3 carbon and 8 hydrogen atoms (C^3H^8)

Methane: The simplest or basic hydrocarbon unit (molecule) that makes up 90% of natural gas.	**Radiant Energy:** The light from either a light bulb or the sun.
Natural gas: A combustible gas found in the earth that is used to heat water, homes, and cook food.	**Renewable Energy:** A nondepletable source of energy as the sun.
Nuclear energy: The energy inside the nucleus of the atom which binds the nucleus together.	**Solar energy:** The primary source of all energy; this is radiation energy from the sun.
Oil: Any of many kinds of combustible liquids obtained from animals and plants that is used as a fuel.	**Steam:** The vapor phase of water that can be used as a energy source.
Oil Shale: A sedimentary rock containing kerogen. The kerogen yields crude oil when heated.	**Tidal Power:** The power created by the falling and rising of the ocean tides.
Uranium: The fuel used in a nuclear reactor to generate electricity.	**Wind:** A form of moving (kinetic) energy produced in part by the sun's heating of the earth's atmosphere.
Water: The potential energy of this liquid when it is located at elevations above sea level can be used to produce electricity.	**Wood:** The fibrous xylem of trees and shrubs often burned for fuel.

Extra blank strips in case one or more get lost.
EXTRA "N"ERGY CARD

N	E	R	G	Y
		FREE		

Extra credit idea: The teacher could make copies of this blank card for students, and they could find or draw pictures of different energy sources to make their own game cards.